

In the Claims:

1-27 (cancelled)

28. (amended) A method of improving the agronomic properties of a plant comprising:

~~maintaining cell energy status within the plant when the plant is subjected to a low oxygen environment maintaining plant vigor and hardiness under stressful conditions~~ by providing the plant with increased cellular levels of a nonsymbiotic plant hemoglobin, thereby ~~maintaining cell energy status in a low oxygen environment and maintaining plant vigor and hardiness under stressful conditions~~; and

growing the plant under stressful conditions, thereby allowing the plant to develop more vigorously under adverse conditions.

wherein the nonsymbiotic plant hemoglobin is a nonsymbiotic plant hemoglobin that is not involved in oxygen diffusion.

29. (previously added) The method according to claim 28 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

30. (previously added) The method according to claim 28 wherein the improved agronomic properties include germination.

31. (previously added) The method according to claim 28 wherein the improved agronomic properties include seedling vigour.

32. (previously added) The method according to claim 28 wherein the improved agronomic properties include reduced cellular levels of fermentation products.

33. (previously added) The method according to claim 28 wherein the improved agronomic properties include increased oxygen uptake.

34. (previously added) The method according to claim 28 wherein the improved agronomic properties include increased tolerance to hypoxic conditions.

35. (amended) A method of selecting seeds for breeding to produce seed lines ~~having increased levels of nonsymbiotic hemoglobin for~~

capable of maintaining energy status in low oxygen environments comprising:

providing a representative seed of a given seed line;
growing the seed such that the seed germinates;
isolating an extract from the seed;
measuring levels of nonsymbiotic plant hemoglobin expression within the extract; and

selecting or rejecting the seed for further breeding based on the hemoglobin levels, wherein increased levels of nonsymbiotic hemoglobin maintain energy status in low oxygen environments. wherein the nonsymbiotic plant hemoglobin is a nonsymbiotic plant hemoglobin that is not involved in oxygen diffusion.

36. (previously added) The method according to claim 35 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

37. (previously added) A method of determining if a seed is germinating comprising:

providing a seed suspected of germinating;
isolating an extract from the seed; and
measuring levels of nonsymbiotic plant hemoglobin expression within the extract,

wherein high levels of nonsymbiotic plant hemoglobin expression indicate that the seed is germinating. wherein the nonsymbiotic plant hemoglobin is a nonsymbiotic plant hemoglobin that is not involved in oxygen diffusion.

38. (previously added) The method according to claim 37 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.